

Information Sources in Environmental Science: A Citation Analysis of Master's Theses

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Florida Gulf Coast University

Florida Gulf Coast University



- ▶ Southwest Florida - Fort Myers
- ▶ Public institution, est. 1991
- ▶ ~15,000 students
- ▶ 58 Undergraduate Programs; 25 Master's; Doctorates in Education, Nursing and Physical Therapy
- ▶ Focus on teaching - 78% of classes taught by full-time faculty
- ▶ Environmental Sustainability

(Florida Gulf Coast University, 2019)

FGCU Library

- ▶ One main library; no branches
- ▶ 223,520 physical items
- ▶ 93,000+ e-books, ~93,000 e-journals
- ▶ ~2,900 visitors and ~2,500 website views per day
- ▶ ~400 librarian-led instruction sessions per year
- ▶ FGCU Scholars Quality Enhancement Plan

(Florida Gulf Coast University Library, 2019)



Environmental Science Program

- ▶ College of Arts and Sciences
 - ▶ Department of Marine and Ecological Sciences
 - ▶ B.A. Environmental Studies
 - ▶ M.A. Environmental Studies
 - ▶ M.S. Environmental Science - thesis required
- ▶ The Water School

Citation Analysis

- ▶ Well established tool for informing collection development, instruction and reference
- ▶ Readily available data
- ▶ Wide variety of methodologies and lack of detail of rationale for methodological decisions can make studies hard to reproduce (Hoffmann & Doucette, 2012)
- ▶ Related studies:
 - ▶ Graduate Biology theses (Miller, 2011)
 - ▶ Graduate Forestry theses (Brazzeal & Fowler, 2008)
 - ▶ Doctoral dissertations in Atmospheric Science (Kaczor, 2014)
 - ▶ Theses and dissertations in Water Resources (2011)

Questions & Goals

- ▶ Resource types
 - ▶ Change of over time? Hypothesis: less books, more websites
- ▶ Core journals and books
- ▶ Currency of resources
- ▶ Library ownership/access to materials
- ▶ Disciplines/subjects of resources
 - ▶ Biology, Agriculture, Chemistry, Geology, etc.

Methods



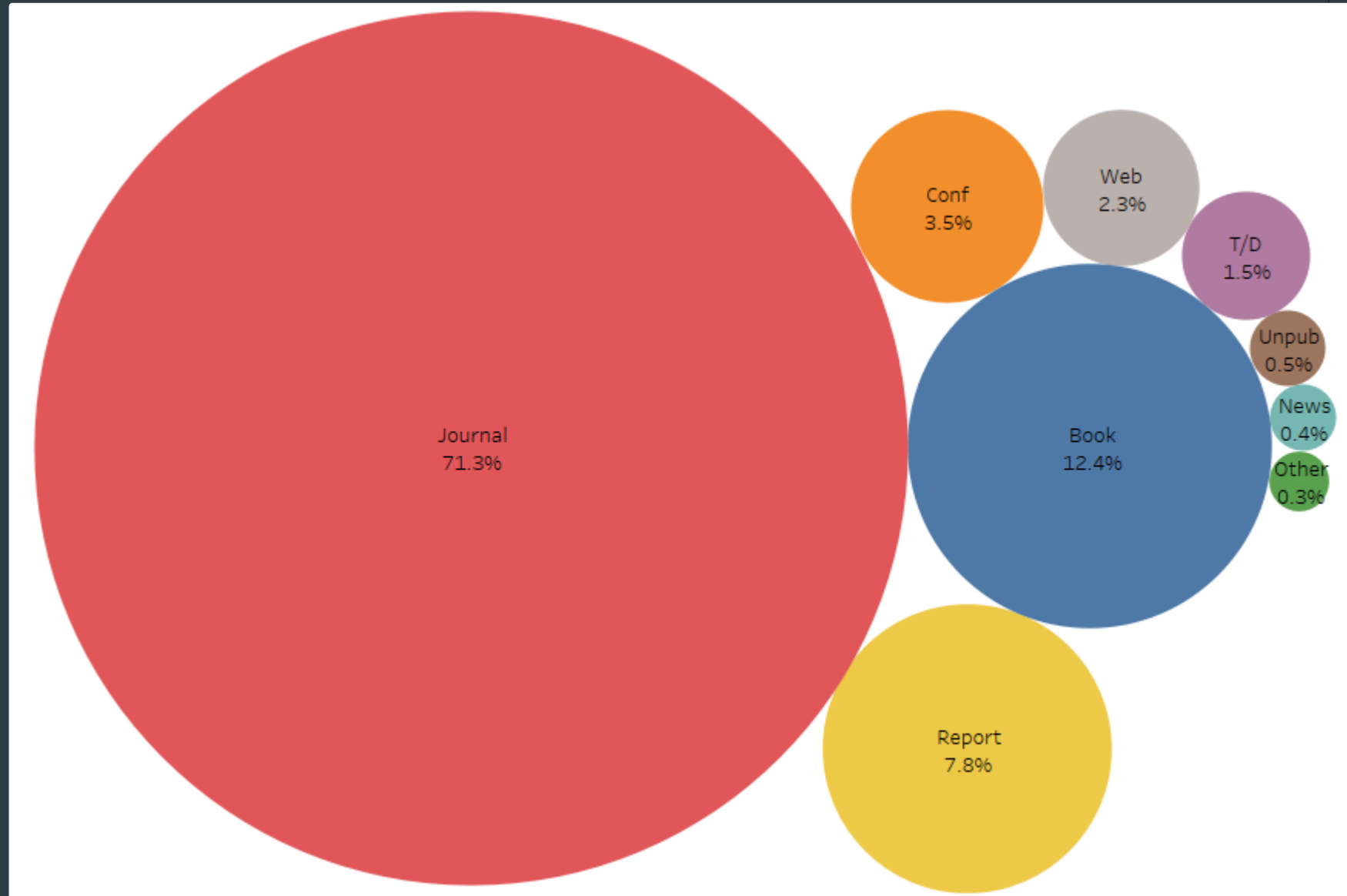
TY - JOUR
ID - 249
A1 - Abdel-Aal, H.
T1 - Multi-Scale Investigation of Surface
Topography of Ball Python
Y1 - 2010
VL - 37
IS - 3
N1 - we have
JF - Tribology Letters
SN - 1023-8883

Results Overview

- ▶ 79 theses in study, from 2006-2017
- ▶ 6,579 total citations
 - ▶ 5,643 unique citations
- ▶ 83 citations per thesis on average
- ▶ Average citation age of 15.6 years

Thesis Year	Theses Count	Total Citations	Avg Citation Count	Avg Citation Age
2006	3	174	58	16
2007	5	428	86	16
2008	6	460	77	10
2009	5	236	47	17
2010	8	693	87	13
2011	11	1,073	98	14
2012	2	130	65	15
2013	7	495	71	18
2014	12	1,060	88	20
2015	8	899	112	15
2016	11	830	75	16
2017	1	101	101	14
Total	79	6,579	83	15.6

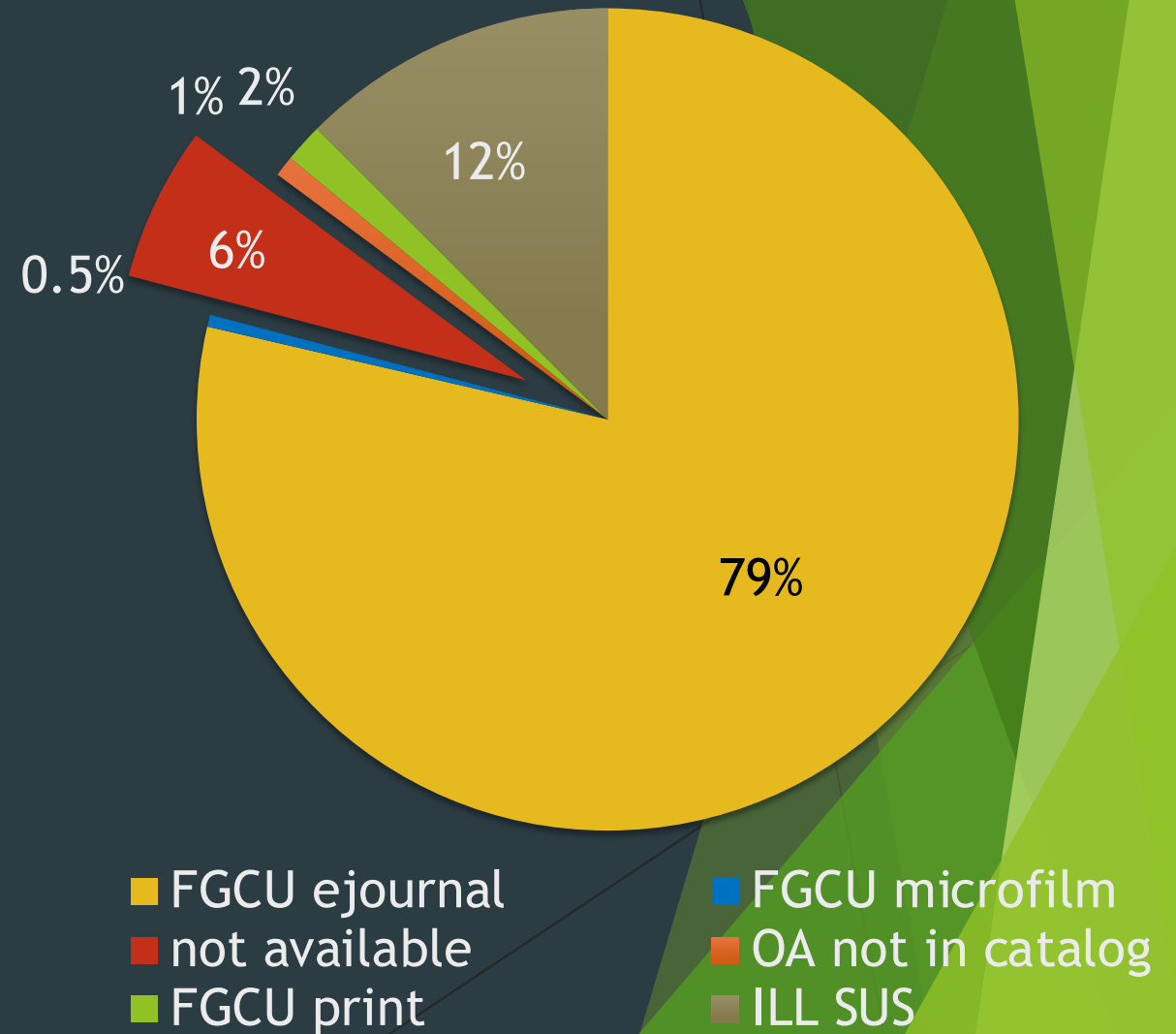
Publication Types



Journals

- ▶ 4688 citations, 4016 unique articles, 1039 unique journals
- ▶ Average citation age: 15.6 years
- ▶ 94% available to FGCU students
- ▶ Oldest Journal cited: *Transactions of the Connecticut Academy of Arts and Sciences* (1869)

Available to FGCU Students

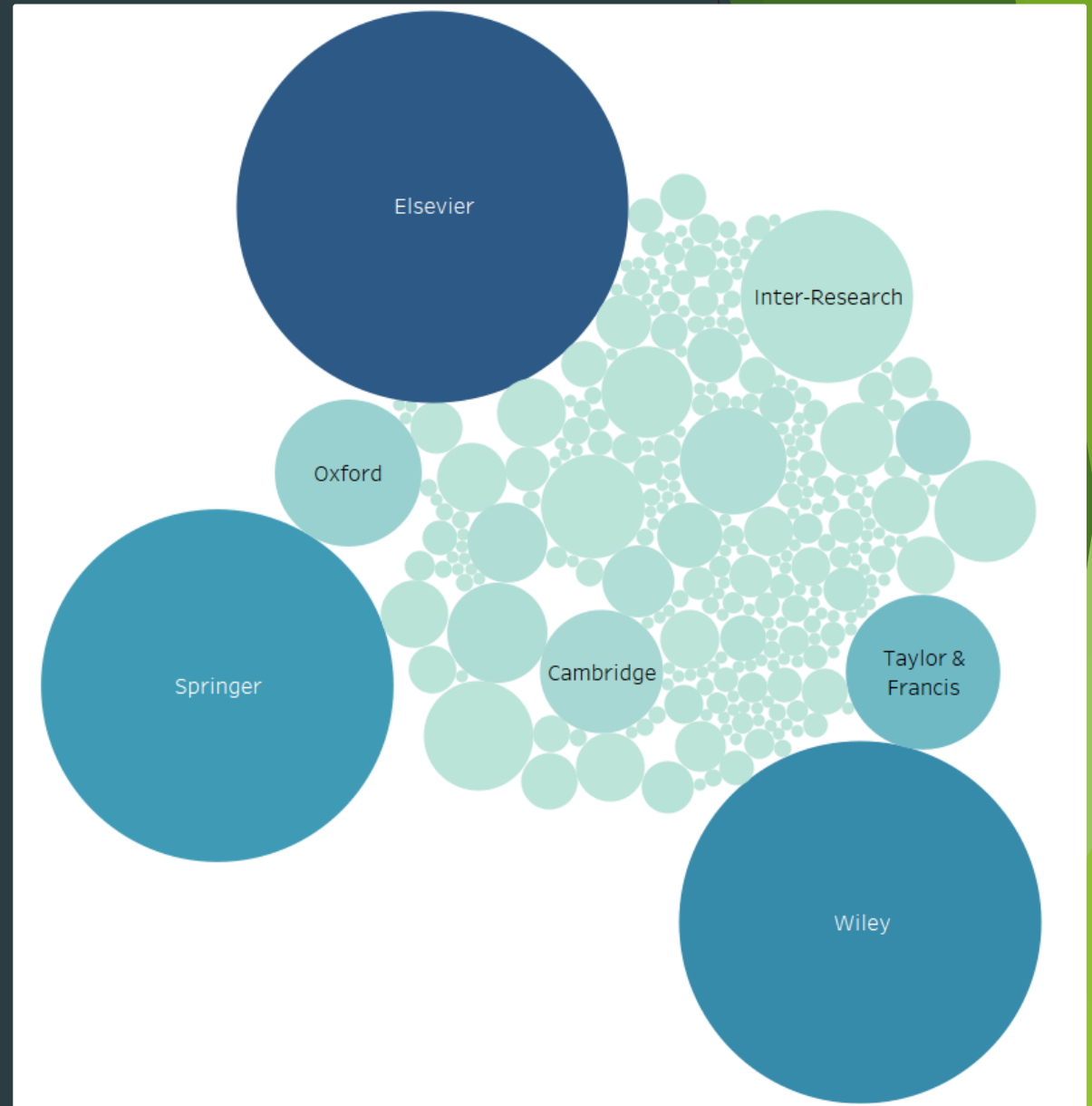


Most Frequently-Cited Journals

- ▶ *Marine Ecology Progress Series* (163)
- ▶ *Estuaries and Coasts* (93)
- ▶ *Limnology and Oceanography* (79)
- ▶ *Estuarine, Coastal and Shelf Science* (72)
- ▶ *Hydrobiologia* (69)
- ▶ *Science* (68)
- ▶ *Ecology* (66)
- ▶ *Journal of Experimental Marine Biology and Ecology* (66)
- ▶ *Journal of Shellfish Research* (63)
- ▶ *Marine Biology* (63)
- ▶ *Estuaries* (58)
- ▶ *Nature* (57)
- ▶ *Environmental Science & Technology* (53)
- ▶ *Aquatic Botany* (48)
- ▶ *Applied and Environmental Microbiology* (44)

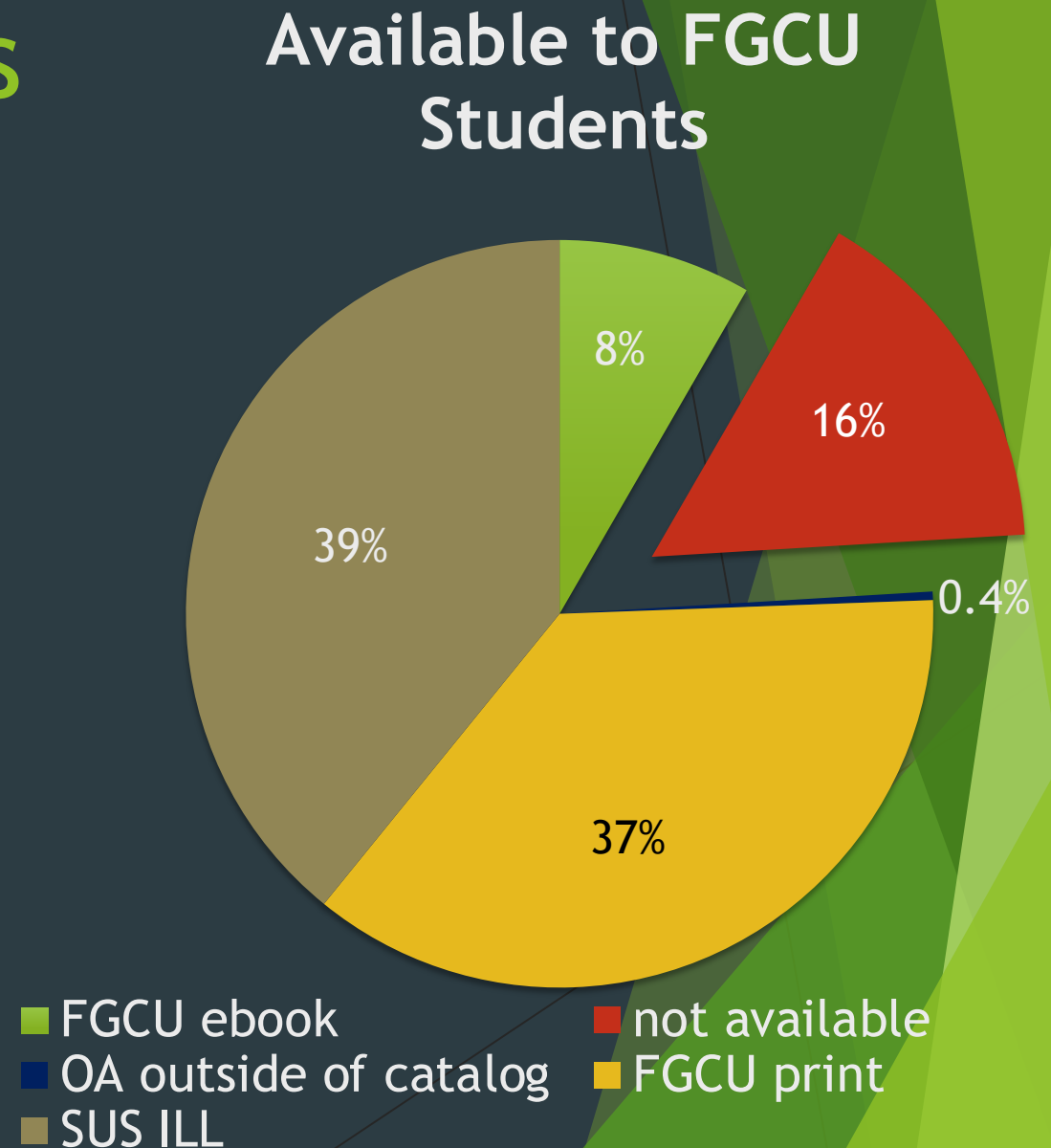
Journal Citations by Publisher

Bubble size increases with times cited, bubble color darkens with number of unique journal titles cited.



Books & Book Chapters

- ▶ 813 citations, 696 unique titles
- ▶ Average age: 20 years
- ▶ 84% available to students
- ▶ Oldest book: Cook's Voyage towards the South Pole and Round the World (1779)

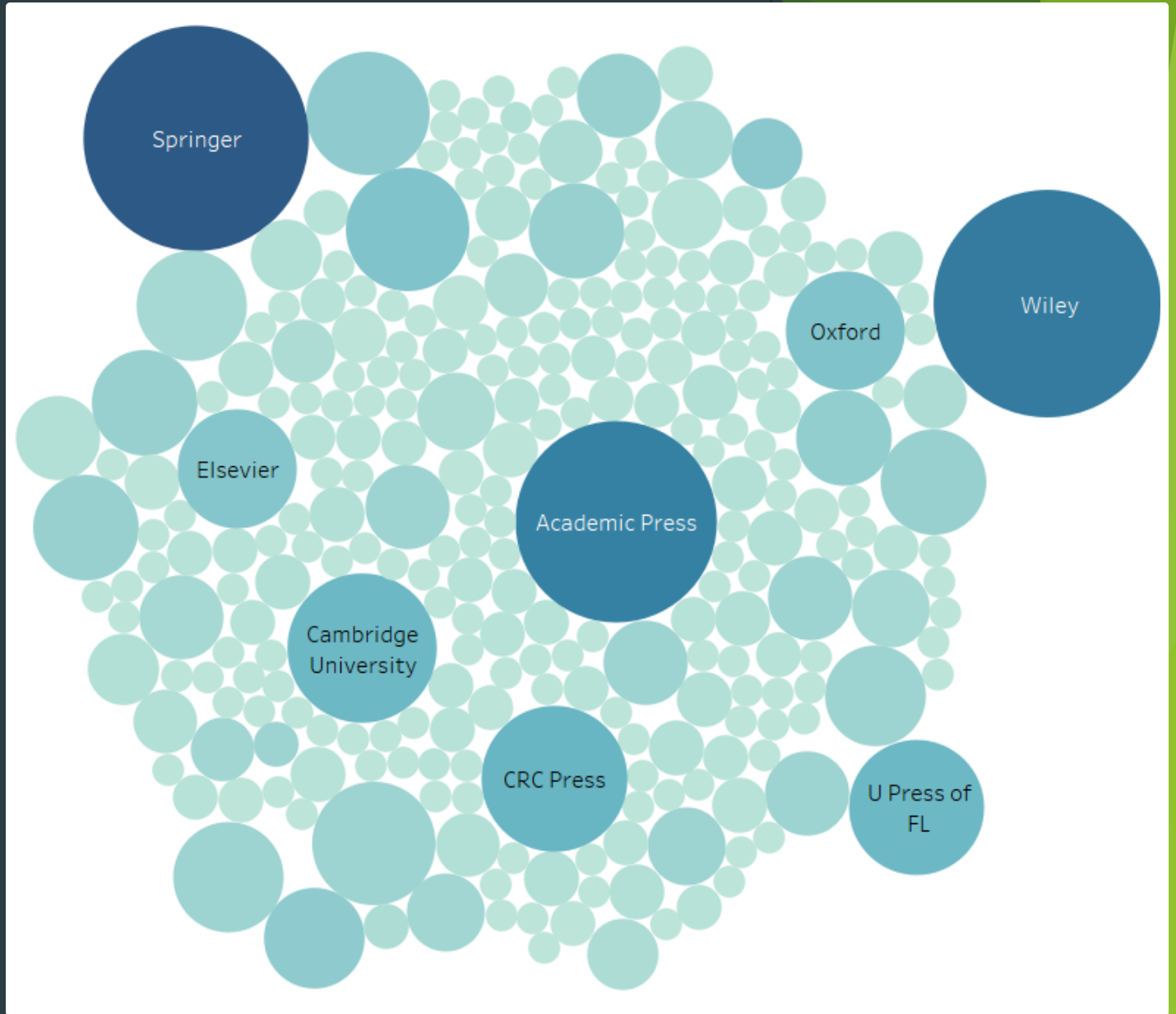


Most Frequently-Cited Books

- ▶ Eastern Oyster; *Crassostrea virginica* (14)
- ▶ Everglades; The Ecosystem and Its Restoration (14)
- ▶ Ecosystems of Florida (12)
- ▶ Essential Readings in Environmental Education (7)
- ▶ Wetlands (7)
- ▶ Ecology of Natural Disturbance and Patch Dynamics (6)
- ▶ Caloosahatchee Estuary Hydrodynamics (6)
- ▶ Cypress Swamps (6)
- ▶ Seafood Toxins; Based on a Symposium Sponsored by the Division of Agricultural and Food Chemistry *etc.*
- ▶ Development of Estuarine Systems in Southwest Florida (5)
- ▶ Pollution Physiology of Estuarine Organisms (5)
- ▶ Vulture Biology and Management (5)
- ▶ Practical Statistics for Environmental and Biological Scientists (5)
- ▶ Ecosystems Analysis of the Big Cypress Swamp and Estuaries (5)
- ▶ Holocene History of the Coastal Geomorphology of Everglades National Park (5)

Book Citations by Publisher

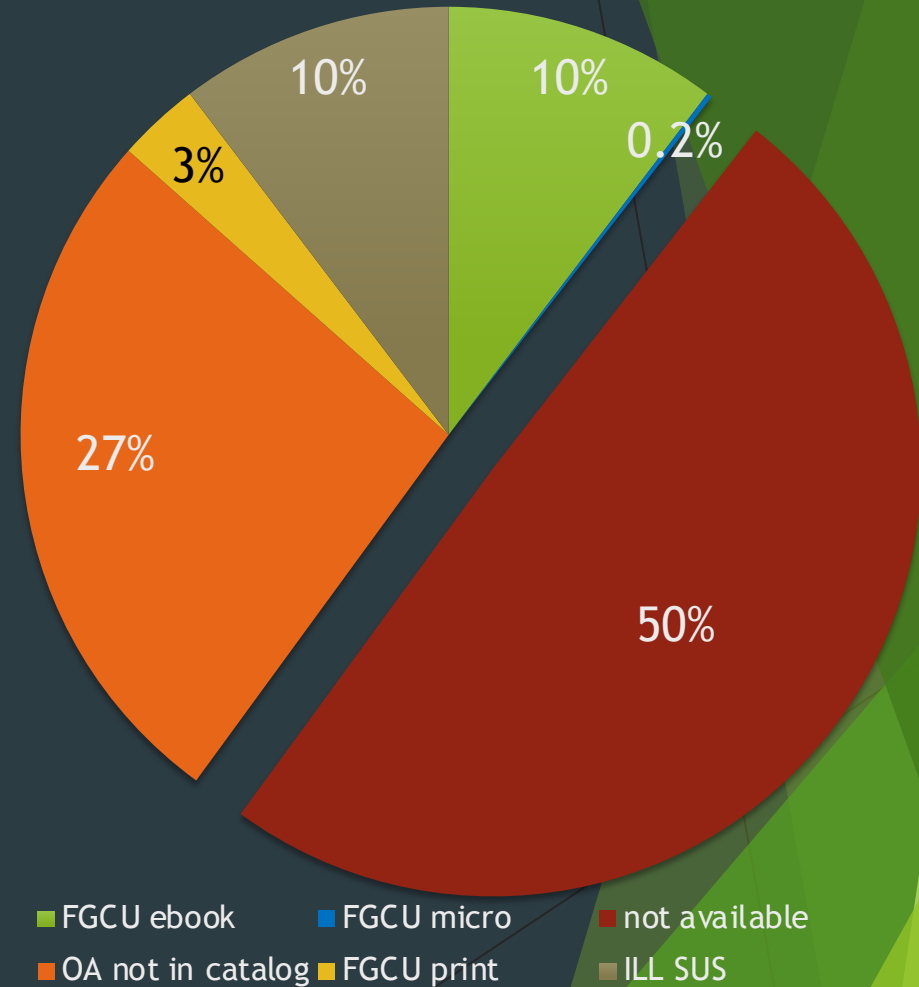
Bubble size increases with times cited, bubble color darkens with number of unique books cited.



Reports

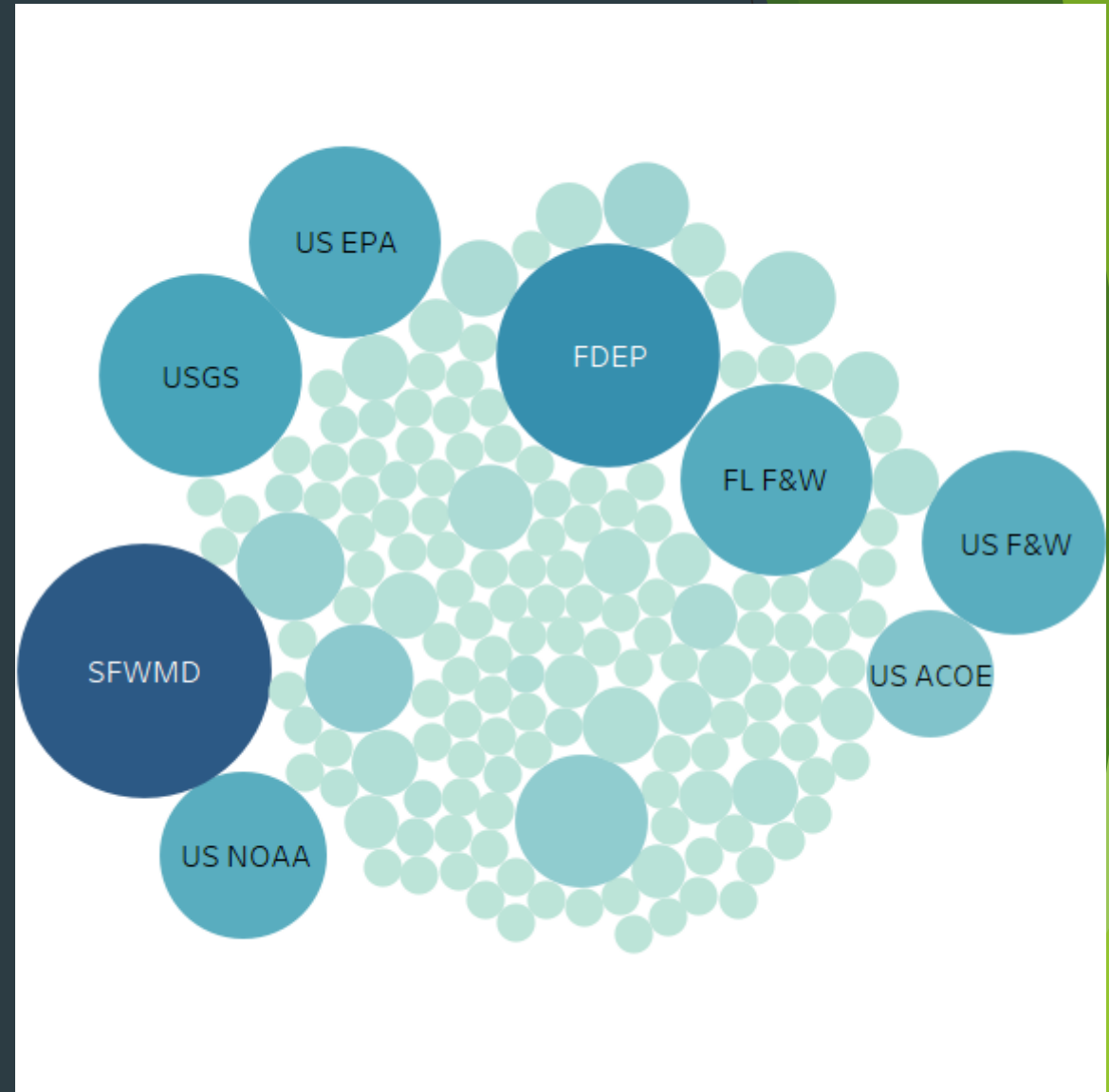
- ▶ 518 total citations, 436 unique titles
- ▶ Most used:
 - ▶ UNESCO's *Tbilisi Declaration* (5)
 - ▶ *Responses of Turbidity, CDOM, Benthic Microalgae, Phytoplankton and Zooplankton to Variation in Seasonal Freshwater Inflow to the Caloosahatchee Estuary* (5)
- ▶ 50% available to students
- ▶ Average Age: 11.5 years
- ▶ Oldest: *Annual Report of the Chief of Engineers, United States Army, to the Secretary of War, for the Year 1889*

Available to FGCU Students



Report Citations by Publisher

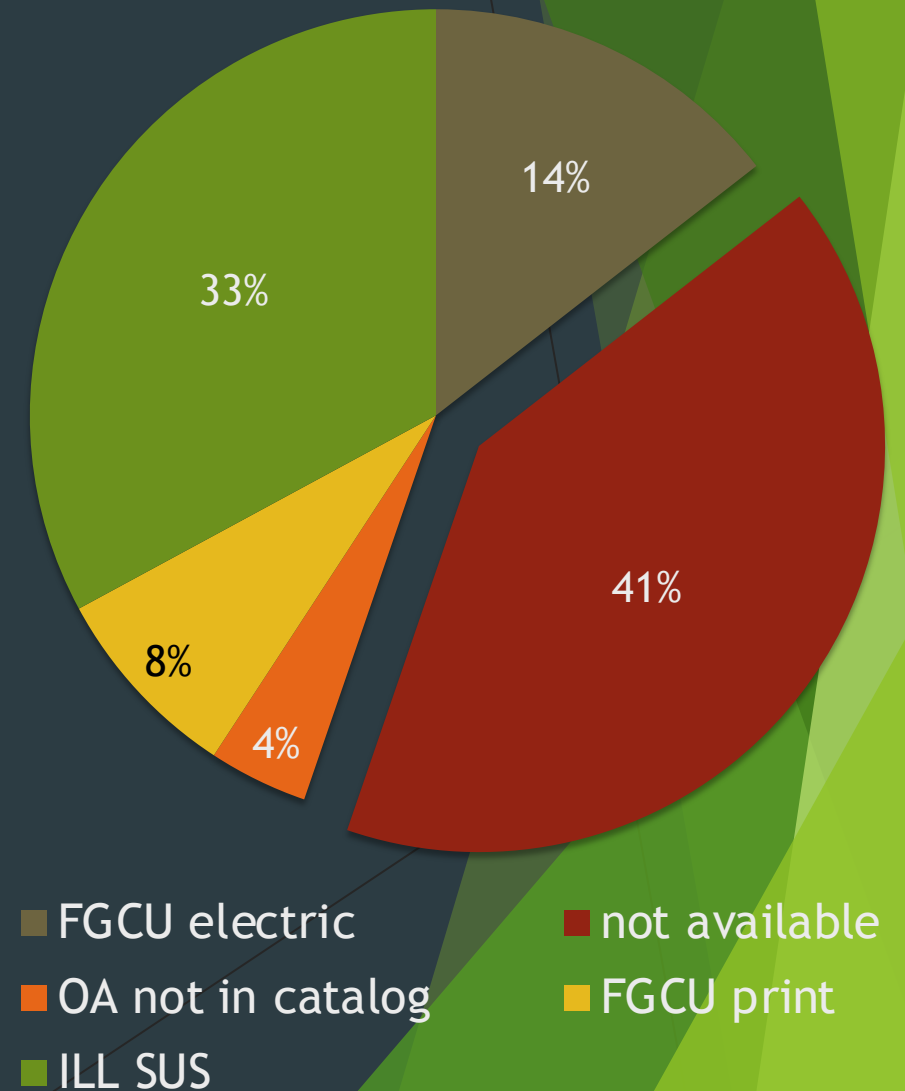
- Bubble size increases with times cited, bubble color darkens with number of unique books cited.



Conference Proceedings

- ▶ 228 total citations, 192 unique articles, 127 unique titles
- ▶ Average age: 21.1 years
- ▶ 59% available to FGCU students
- ▶ Oldest title: *Proceedings of the United States National Museum* (1925)

Available to FGCU Students

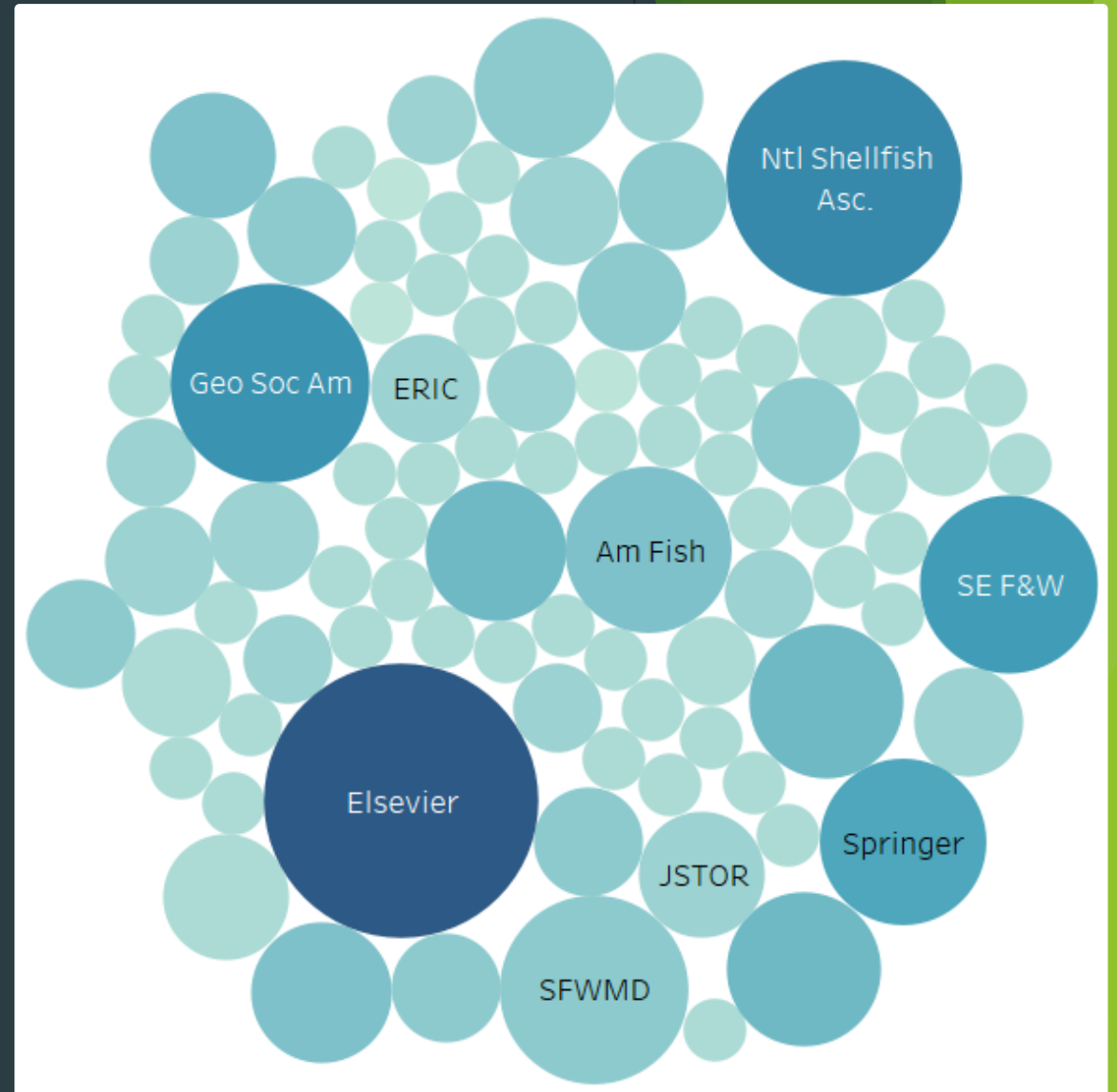


Most Frequently-Cited Conference Proceedings

- ▶ *Proceedings of the National Shellfisheries Association* (13)
- ▶ *Geological Society of America Abstracts with Programs* (8)
- ▶ *Proceedings of the Charlotte Harbor Public Conference and Technical Symposium* (8)
- ▶ *Proceeding of the Southeastern Association of Fish and Wildlife Agencies* (7)
- ▶ *Proceedings of the International Conference on Toxic Marine Phytoplankton* (7)
- ▶ *Proceedings of the International Conference on Harmful Algae* (6)
- ▶ *Oyster Reef Habitat Restoration* (6)

Conference Citations by Publisher

Bubble size increases with **times cited**, bubble color darkens with number of unique titles cited.

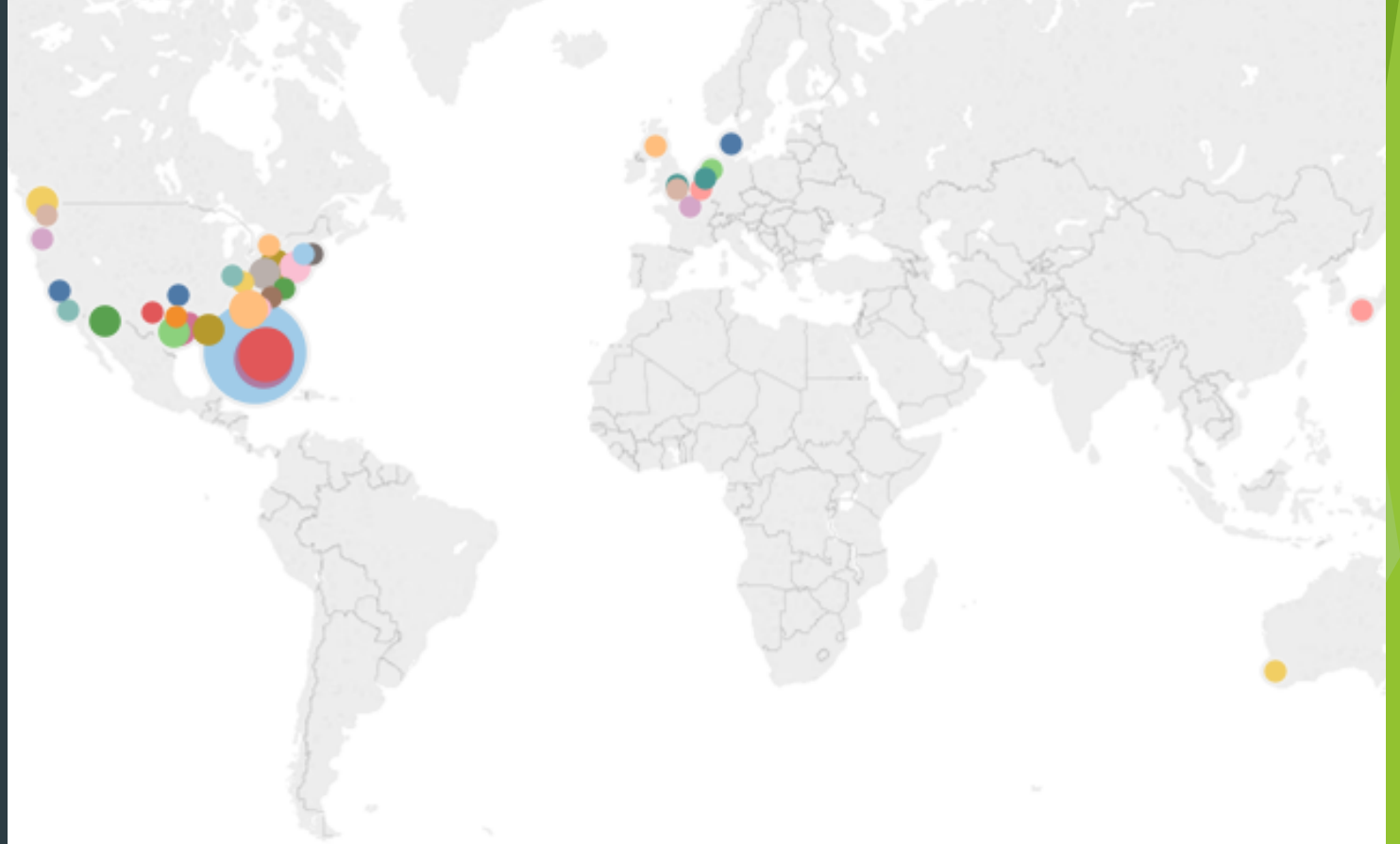


Websites

- ▶ 150 total citations, 61 unique websites
- ▶ Most popular websites:
 - ▶ Florida Gulf Coast University (14)
 - ▶ National Oceanic and Atmospheric Administration (14)
 - ▶ Environmental Protection Agency (9)
 - ▶ South Florida Water Management District (9)
 - ▶ U.S. Geological Survey (6)
 - ▶ Cornell University (6)
 - ▶ International Union for Conservation of Nature (5)

Theses & Dissertations

- ▶ 103 citations, 86 unique titles
- ▶ 72% available to FGCU students
- ▶ University Sources:
 - ▶ 20% from FGCU
 - ▶ 54% from Florida
 - ▶ 87% from U.S.

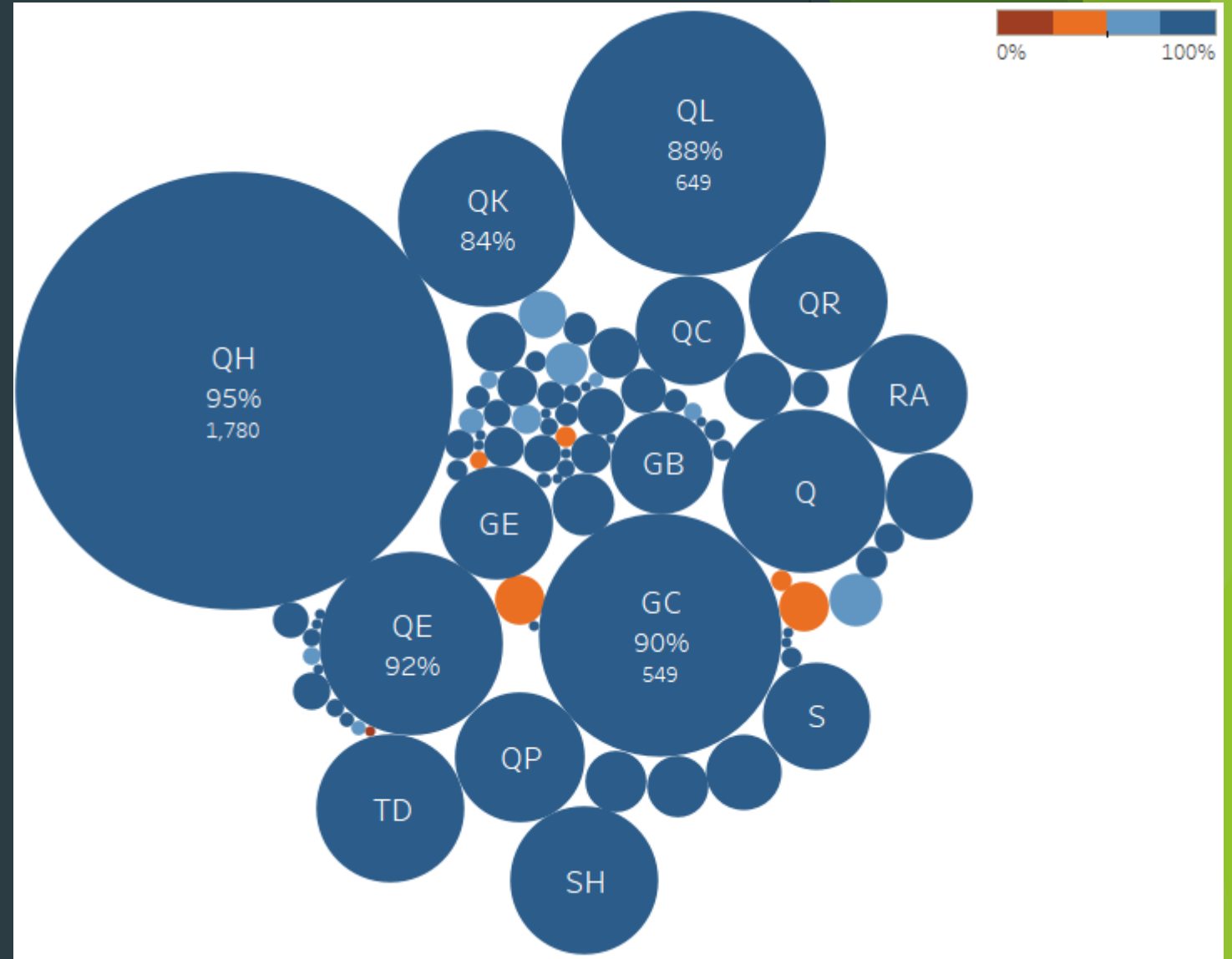


Miscellaneous Publication Types

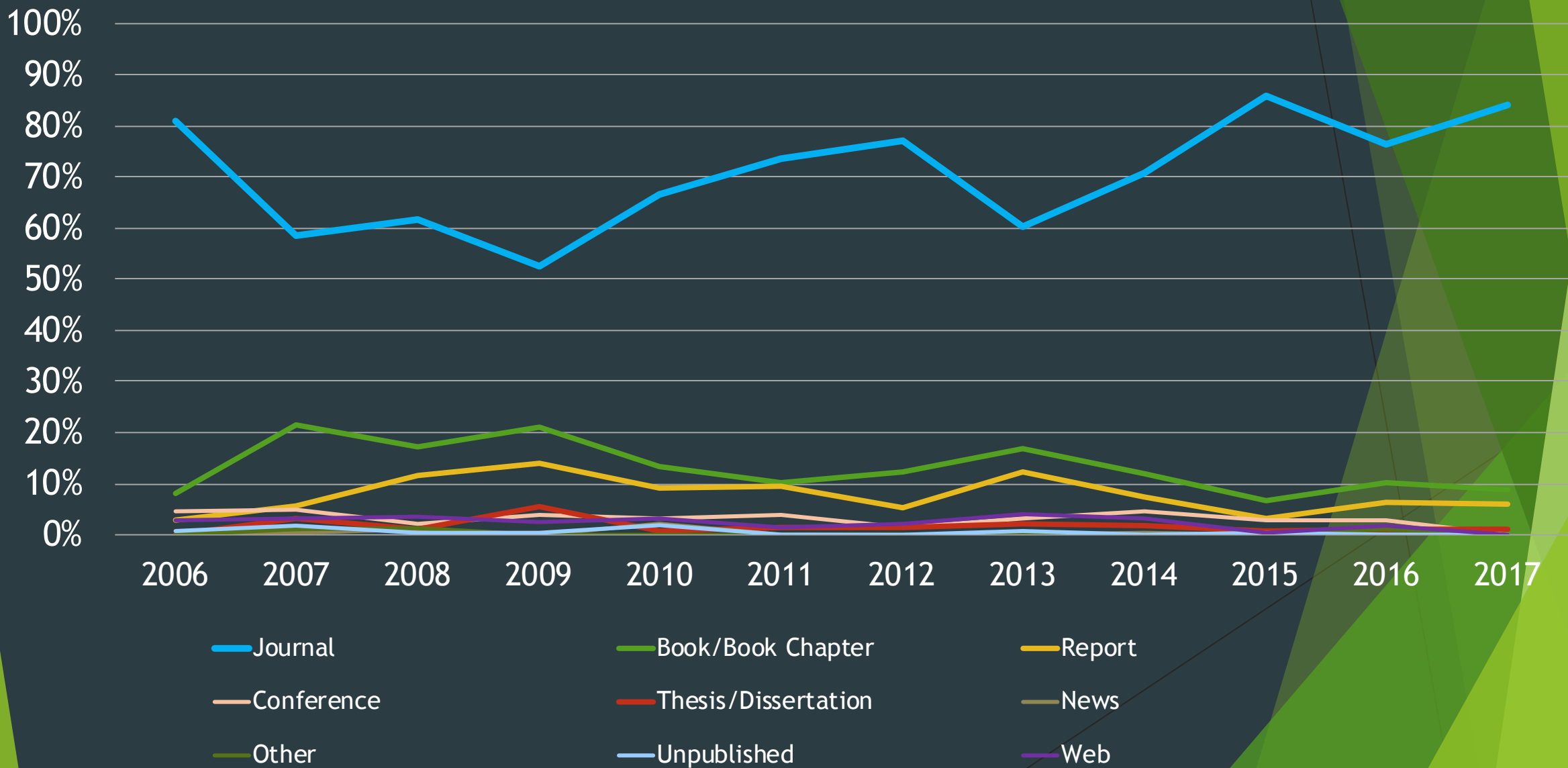
- ▶ Maps (4 total citations)
- ▶ Unpublished materials (20)
- ▶ News Sources (27)
- ▶ Personal or internal communications (15)
- ▶ Video (1)
- ▶ Other (10)

Availability of Journals, Books and Conference Papers by Call Number

Bubble size increases with total citations, color changes with percentage available to FGCU students, as indicated by legend



Format Types over Time



Conclusions

- ▶ Thesis topics are highly influenced by faculty research and program structure
- ▶ Importance of grey literature, esp. government reports
- ▶ Environmental science is interdisciplinary
- ▶ Historical sources remain important

Future Directions

- ▶ Share results with Environmental Science faculty
- ▶ Focus group discussions with graduate students
- ▶ In-depth look at grey literature sources
- ▶ Compare with undergraduate research projects
- ▶ Compare with other schools

References

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- ▶ Wirth, A. A., & Mellinger, M. (2011). Five years later: Predicting student use of journals in a new water resources graduate program. *Issues in Science & Technology Librarianship*, (64), 49-62.

Questions?